

CLAIMS

We claim:

1. A method for statistical modeling and simulation of the impact of global variation and local mismatch on the performance of integrated circuits, comprising the steps of:
 - a) estimating a representation of component mismatch from device performance measurements in a form suitable for circuit simulation;
 - b) reducing the complexity of statistical simulation by performing a first level principal component or principal factor decomposition of global variation, including screening;
 - c) further reducing the complexity of statistical simulation by performing a second level principal component decomposition including screening for each factor retained in step b to represent local mismatch; and
 - d) performing statistical simulation with the joint representation of global variation and local mismatch obtained in step c.
2. A method of modeling and simulating the impact of local mismatch on performance of integrated circuits comprising the steps of:
 - a) estimating a representation of component mismatch in a form suitable for circuit simulation from device performance measurements;
 - b) reducing the complexity of statistical simulation by performing principal component or principal factor decomposition for local mismatch, including screening; and

8 c) performing statistical simulation with local mismatch obtained in step b.

1 3. The method of claim 2 where the principal component or principal factor decomposition
2 is performed using eigenvalue eigenvector decomposition.

1 4. The method of claim 1 where the first principal component or principal factor
2 decomposition is performed using eigenvalue eigenvector decomposition.

1 5. The method of claim 1 where the second principal component or principal factor
2 decomposition is performed using eigenvalue-eigenvector decomposition.

1 6. A method for statistical modeling and simulation of the impact of global variation and
2 local mismatch on the performance of integrated circuits, wherein said method is
3 integrated in a statistical design and optimization computer-aided design tool to perform
4 statistical simulation of joint and separate impact of global variation and local mismatch
5 on performance of integrated circuits and said method comprises the steps of:

- 6 a) estimating a representation of component mismatch from device performance
7 measurements in a form suitable for circuit simulation;
8 b) reducing the complexity of statistical simulation by performing a first level
9 principal component or principal factor decomposition of global variation,
10 including screening;

- c) further reducing the complexity of statistical simulation by performing a second level principal component decomposition including screening for each factor retained in step b to represent local mismatch; and
- d) performing statistical simulation with the joint representation of global variation and local mismatch obtained in step c.

7. A method of modeling and simulating the impact of local mismatch on performance of integrated circuits, wherein said method is integrated in a statistical design and optimization computer-aided design tool to perform statistical simulation of joint and separate impact of global variation and local mismatch on performance of integrated circuits and said method comprises the steps:

- a) estimating a representation of component mismatch in a form suitable for circuit simulation from device performance measurements;
- b) reducing the complexity of statistical simulation by performing principal component or principal factor decomposition for local mismatch, including screening; and
- c) performing statistical simulation with local mismatch obtained in step b.

8. The method of claim 7 where the principal component or principal factor decomposition is performed using eigenvalue eigenvector decomposition.

